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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KIELIN, ERIK J

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 10/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/992,474

Applicant(s)

PARK ET AL.

Examiner

Erik Kielin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 10-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). 14
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of the species of Fig. 2 in Paper No. 14 (the interview summary), with claims 1-9 and 14 indicated to read thereon is acknowledged. The traversal is on the ground(s) that two species is not an unreasonable number of species. This is not found persuasive because MPEP 806.04(e) states, "Claims may be restricted to a single disclosed embodiment (i.e., a single species, and thus be designated a specific species claim)...".

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 10-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim.

Drawings

3. The drawings, Figs. 4A-4D and 6A-6D, are objected to because the specification at pages 4 and 5 indicate that the Figs. 4A-4D and 6A-6D show the "luminance as a function of view angle," yet the graphs are labeled "contrast ratio" versus "view angle." By contrast, Figs. 3A-3D and 7A-7D are indicated in both the specification and the figures to be "contrast ratio" versus "view angle." Accordingly, it is unclear that which is shown in the Figs. 4A-4D and 6A-6D, "contrast ratio" or "luminance as a function of view angle."

4. The drawing, Fig. 9, is objected to because the axes of the graph are not labeled, and because to legend does not show which line is the 0 voltage as indicated in the legend on p. 5 of the specification.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claim 1 is objected to because of the following informalities:

in lines 4 and 5, replace “surfaces” with --surface-- because there is only one inner surface;

in line 8, replace “withing” with --within-- for correct spelling; and

in line 9, replace “angle” with --angles-- for correct grammar.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicant amended claim 1 in the Amendment filed 30 May 2003 (Paper no. 8) to indicate that the contrast ratio at the first gray voltage is equal to greater than 0.8 “times of the”

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contrast ratio “in all view angle[s]” when the voltage value of the first gray applied between the pixel and the common electrode is zero. This is not taught in the specification. There is nowhere in the specification or the figures a teaching indicating that the contrast ratio at the first gray voltage is some multiplicative factor (i.e. 0.8) of the contrast ratio of zero voltage. Rather Fig. 9, as explained in the specification in the paragraph bridging pages 13 and 14, indicates only that the contrast ratio is greater than or equal to 0.8. See also p. 11 of the specification. The specification indicates that there is only “comparison to” the contrast ratio at zero applied volts -- not multiplied by, as presently claimed. Finally, it is noted that Fig. 9 specifically contradicts this limitation. For example, the contrast ratio for the 0 voltage line (not specifically indicate in the legend of the graph, but the only remaining line) is 2.6. Eighty percent (0.8) of 2.6 is 2.1. Virtually all of the 1.4 voltage line (outside of the -20 to +20 degree viewing angles) falls outside the claimed limitation and is therefore **not enabled** for all viewing angles. (See instant claim 6 which indicates that the voltage range according to claim 1 may be 1.4 V or less, as well as the specification.)

The remaining claims 2-8 are rejected for depending from the above rejected claims.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 9 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claim 9 indicates in line 4 that the first and second panels each have a common electrode on the inner surface. Examiner assumes, in concert with the specification and the figures, that one of the substrates has pixel electrodes thereon.

Claim 9 recites the limitation "the pixel electrode" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,298,199 (**Hirose et al.**).

Regarding claim 1, **Hirose** discloses a liquid crystal display comprising:

a first panel **71** having inner and outer surfaces;

a second panel **73** facing the first panel and having inner and outer surfaces;

a pixel electrode provided on the inner surfaces of the first panel (col. 3, lines 62-67);

a common electrode provided on the inner surfaces of the second panel (col. 3, lines 62-67); and

a liquid crystal layer **72** (col. 3, lines 62-67) between the first and the second panels, wherein voltage value of a first gray (called “V_{OFF}”) representing the darkest state applied between the pixel electrode and the common electrode is within a voltage range giving a contrast ratio to be equal to or higher than about 0.8 “times of the” contrast ratio in all viewing angle when the voltage value of the first gray applied between the pixel electrode and the common electrode is zero. See Fig. 2 of **Hirose**, which shows that a voltage is applied to further reduce light transmission under an applied voltage versus zero voltage and improves the contrast over that at zero applied voltage (col. 4, lines 30-49). Accordingly, the contrast ratio at the first gray voltage is greater than 1 times the contrast ratio at zero voltage, which is greater than 0.8 times.

It is seen to be inherent that the pixel and common electrodes are on the inner surfaces of the first and second substrates **71**, **73**; otherwise, the electric field generated would be insufficient to control the orientation of the liquid crystals **72**.

Regarding claim 2, **Hirose** discloses the liquid crystal display of claim 1, further comprising a first and second polarizers **50**, **80** disposed on respective outer surfaces of the first and the second panels (Fig. 1; col. 3, lines 57-60).

Regarding claim 3, **Hirose** discloses the liquid crystal display of claim 2, wherein the liquid crystal layer is vertically aligned in absence of electric field (Figs. 1 and 2; sentence bridging cols. 3-4).

12. Claims 9 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,407,791 B1 (Suzuki et al., **Suzuki-1** hereafter).

Regarding claim 9, **Suzuki-1** discloses a liquid crystal display comprising:

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a first and second panel **11**, **12**, each having inner and outer surfaces, with inner surfaces facing each other;

a common electrode **73** disposed on the inner surface of the first panel and a pixel electrode **71** disposed on the inner surface of the second panel; and

a liquid crystal layer having crystal molecules **21** disposed between the first and second panels, wherein a domain defining member **74** is formed in one of the common electrode **73** and the pixel electrode **71** for restricting the tilt directions of the crystal molecules.

(See Figs. 37-39, col. 26, line 26 to col. 28, line 44, for example; paragraph bridging cols. 14-15, for example.)

Regarding claim 14, the domain-defining member **74** includes a plurality of openings arranged laterally along a longitudinal direction, with at least one opening disposed in a direction transverse to the longitudinal direction (Figs. 37-39).

13. Claims 9 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,573,695 B1 (**Liu et al.**).

Regarding claim 9, **Liu** discloses a liquid crystal display comprising:

a first and second panel **301**, **401** each having inner and outer surfaces, with inner surfaces facing each other;

a common electrode **403** disposed on the inner surface of the first panel and a pixel electrode **306-308** disposed on the inner surface of the second panel; and

a liquid crystal layer having crystal molecules **314** disposed between the first and second panels, wherein a domain defining member **302**, **303**, **404**, **406** is formed in one of the common

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electrode **403** and the pixel electrode **306-308** for restricting the tilt directions of the crystal molecules.

(See Figs. 2-5, col. 4, line 19 to col. 5, line 57.)

Regarding claim 14, the domain-defining member includes a plurality of openings **302**, **303**, **404**, **406** arranged laterally along a longitudinal direction, with at least one opening disposed in a direction transverse to the longitudinal direction (Fig. 2, col. 3, lines 3-13; col. 4, lines 52-57, col. 5, lines 52-57).

14. Claims 9 and 14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by US 5,309,264 (**Lien et al.**). See Abstract and figures.

15. Claims 9 and 14 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by US 6,256,082 B1 (Suzuki et al., **Suzuki-2**, hereafter). See Abstract and figures.

16. Claims 9 and 14 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by US 5,646,705 (**Higuchi et al.**). See Abstract and figures.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hirose** et al. in view of US 6,256,082 B1 (Suzuki et al., **Suzuki-2** hereafter).

Regarding claims 4, 5, and 7, the prior art of **Hirose**, as explained above, discloses each of the claimed features except for the electrodes further comprising domain-defining member for restricting the tilt directions of molecules in the liquid crystal layer, provided in one or both of the first and the second panels, wherein the domain-defining member is openings in the pixel electrode or the common electrode.

Suzuki-2 teaches that openings are provided in the pixel and/or common electrodes to restrict the tilt directions (col. 3, lines 17-23) which creates micro-regions (i.e. domains) and improves the contrast and view angle (col. 3, lines 13-16).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use domain-defining openings in the electrodes of **Hirose** to improve the contrast and view angle, as taught by **Suzuki-2**.

Regarding claim 6, the prior art of **Hirose**, as explained above, discloses each of the claimed features except for the voltage value of the first gray is equal to or lower than 1.4 V. The selection of 1.4 V or the first gray voltage is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. See *In re Jones*, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and *In re Boesch*, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious).

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Regarding claim 8, **Suzuki-2** teaches at least two micro-regions (i.e. domains), which reads on the limitation "wherein regions divided by the openings are classified into four domains depending on the tilt directions of the liquid crystal molecules." (See Figs. 5a-5h).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 703-306-5980. The examiner can normally be reached on 9:00 - 19:30 on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Erik Kielin
Primary Examiner
October 9, 2003